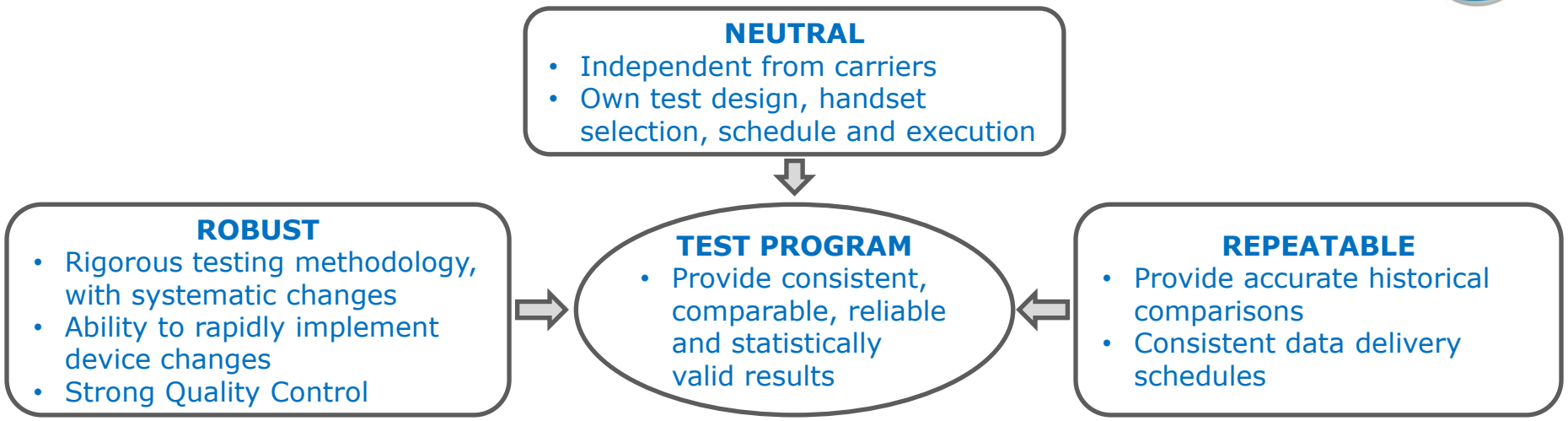
FCC Response

Nov 30, 2010

Important Testing Criteria



Category	Impact
Metrics	• Metrics should capture customer perceptible impact, e.g., exclude reconnects that are not customer perceptible • Metrics reporting/ averaging should follow accepted engineering and statistical principles
Oversight	• Define a formal change control process, with sufficient time to incorporate carrier input • Data collected should be audited by a neutral third party, distinct from the data collector
Notification	• If periodic testing is used, carriers should be notified as to when testing will take place • Data collection methodologies and measurable metrics should be clearly defined and agreed upon by all carriers • Benchmarking platform limitations should be clearly defined • Data post processing business rules should be clearly defined
Carrier Input	• Allow carrier input into the testing equipment, test methodology and devices chosen for testing
Statistically Significant	• Need sufficiently large sample sizes • Differences between measurements must be statistically significant • Market results need to be rolled-up weighted by market populations

Packet Data Testing

PACKET DATA

CATEGORY	IMPACT

Device	• Devices have varying levels of radio performance, and can have a significant impact on the collected results. Devices should be as equivalent as possible across carriers (same OS, processors), cross carrier and cross device comparisons may be skewed due to differences in
	  • Device capabilities, i.e., processors/ memory of the devices used for testing
	  • APIs enabled in the device operating system
	  • APIs enabled by the device manufacturer/OEM or the carrier
	• Representative of devices consumers use, use the same hardware/ software configuration available to consumers
	• Use the device enabled to support the latest technology upgrade for each carrier

Test Locations	• Test as many different locations as possible within a market • Need to collect data from markets representing 2/3rd of the US Population • Adequate representation of usage both while mobile (including sufficient handoffs) and stationary • Need statistically significant samples from both urban and suburban locations • Need statistically significant samples from both usage indoors and outdoors, and geo/ location tagged wherever possible
Test Timing	• Collect data during the times that consumers use the network • Capture both peak and off-peak usage • Test repeated a minimum of twice a year, preferably three times per year
Scenarios	• Use representative data scenarios, excluding VPN
Methodology	• If external antennas are used, then the attenuation should be tailored to the specific device, carrier, based on third party testing and validation • Ensure that no location is oversampled/over represented in the data collected • Exclude tests that cannot be applied equally across all types of networks, e.g., no simultaneous voice and data testing unless all networks support this equally • File sizes used in uploads and downloads should be large enough to measure steady state speeds • Test platform limitations should be clearly communicated • Testing for all networks should use the same platform and test scripts • Test protocols should be representative of the ones widely prevalent in consumer usage • Results to be broken out by type of technology (EDGE, HSPA, 1xRTT, EVDO etc.)

Crowd Sourcing would need to adjust for several additional biases inherent in the collection

CROWDSOURCED DATA COLLECTION	CATEGORY	IMPACT
	Device	• Need ability to identify failing/ 'defective' devices, which can significantly skew overall results • Need to be able to track device firmware, driver versions to ensure that the most up to date software/ hardware usage • Define minimum quotas of each type of device required for representative cross device/ cross carrier comparisons
	Test Locations/ Geography	• Define parameters for cross-carrier, cross-device comparisons, to ensure that data collected from each device type, each carrier is from a random spread of locations within a market • Define lowest level of granularity for collecting representative data, i.e., if each mile of a highway needs to be sampled, then we need a larger sized panel
	Test Timing	• Define parameters for comparisons of carriers when the data is collected at different times on different carriers, e.g., peak usage on carrier 1 vs. off peak usage on carrier 2
	Scenarios	• Ensure that data is not collected from outlier device experiences that trigger dramatically different usage patterns • Ensure that web site/ web server latencies/ outages do not skew collected results
	Methodology	• Need to avoid repetitive oversampling in specific locations, 'over' contributions of a few zealous panelists • Need ability to turn on/ turn off collection for a specific device, at a specific time
	Sample Sizes	• Need a minimum of 200 panelists per carrier per market in smaller markets, larger, more densely populated markets would need a proportionally larger panel for each carrier • Need a minimum level of activity per panelist per month